ANNUAL REPORT

OPERATION OF THE FOREST INSECT LABORATORY

SAULT STE. MARIE, ONTARIO

FISCAL YEAR 1953-54

R. M. Belyea

CANADA DEPARTMENT OF AGRICULTURE

SCIENCE SERVICE

FOREST BIOLOGY DIVISION

JULY, 1954

ANNUAL REPORT
OPERATION OF THE FOREST INSECT LABORATORY
SAULT STE. MARIE, ONTARIO
FISCAL YEAR 1953-1954

1. GENERAL

In 1953, spruce budworm infestations in northern Ontario generally maintained levels of intensity equal to or exceeding those in 1952, and showed only minor changes in extent. The infestation in the northwestern part of the Province increased in area by 1,500 square miles to cover a total of approximately 16,000 square miles. For the sixth consecutive year, a heavy infestation persisted on balsam fir on Sibley and Black Bay Peninsulas, and first tree mortality was observed. Other than a small infestation in Kapuskasing District which increased slightly in extent, scattered light infestations over the remainder of the Province generally declined in extent and severity. Only minor changes in the extent of host tree mortality were observed in the northwestern part of the Province, while the severity of mortality increased.

A spectacular change in the forest tent caterpillar infestation in northwestern Ontario occurred in 1953. In 1953 this infestation covered approximately 40,000 square miles, and on the basis of fall egg-band surveys a continuing heavy infestation was to be expected in 1953. However, low temperatures accompanied by high winds, freezing rain and snow, following the unusually early development of aspen shoots and hatching of tent caterpillar eggs in the spring, resulted in severe killing of foliage and small larvae. Larval populations surviving these adverse conditions, were subsequently reduced to the point of extinction during the long period while aspen trees were devoid of foliage. As a result, the heavy infestation in the fall of 1953 extended over only approximately 7,000 square miles.

Elsewhere in the Province, the infestation in the districts north and east of the Sault Ste. Marie District increased in extent and severity, while in the Sault Ste. Marie, southern part of the Sudbury, Parry Sound, Lake Simcoe and Lindsay districts it declined markedly, primarily as a result of increased parasitism and disease.

Intensive studies in progress in southern Ontario during the past several years of the life history and habirs of insects affecting seed production of red pine have suggested methods of control which might be undertaken to protect cones on red pine growing in seed orchards. The cone beetle, Conophthorus resinosae, potentially the most destructive species, overwinters in the adult stage in the buds of small twigs which drop to the ground in the autumn. Collection and burning of these twigs in the late autumn would eliminate the source of infestation for the following year. Other insect species, mainly Lepidopterous borers, attack the developing cones as larvae in early summer and prevention of such attack by protective sprays applied to the cones is suggested. Small-scale experimental control studies are planned for 1954.

Intensive investigation during the past two years of the mode of action of pathogenic strains of Bacillus cereus has revealed that these bacteria cause a toxaemia in larch sawfly larvae. There is good evidence that the enzyme Lecithinase, produced by B. cereus, plays a major role in bringing about this toxic condition. There is a very apparent difference in ability to produce Lecithinase between different strains of B. cereus, and this factor is being used to screen B. cereus strains in an effort to isolate those more virulent for the host insect.

The 1953 season marked the first in which the Forest Insect Survey at Sault Ste. Marie assumed responsibility for the whole of the Province of Ontario. Previously, an organization had been maintained at Ottawa,

responsible for Survey work in southern Ontario, but in order to center all Survey work under one authority, the Ottawa establishment was closed during the winter of 1952-53, and responsibility for southern Ontario shifted to Sault Ste. Marie. A total of 8956 collections was handled by the Forest Insect Survey at Sault Ste. Marie during the 1953 season.

The Forest Insect Laboratory continued its co-operation with the Division of Timber Management, Ontario Department of Lands and Forests, and the Forest Pathology Laboratory, Toronto, in the conduct of a study of cull factors in various timber species in the Black Sturgeon area. A crew employed in sampling decay agents was again accommodated and fed in the Black Sturgeon Lake Field Station, and Mr. J. T. Basham, Forest Pathology Laboratory, continued his investigations of agents of deterioration of balsam fir at that location.

Mr. K. B. Turner, Division of Timber Management, Ontario Department of Lands and Forests, occupied the cottage provided for him in 1952 at the Black Sturgeon Lake Field Station by the Department of Lands and Forests, and undertook the establishment of research plots in the Black Sturgeon area. These plots are being established for future research work in the area as a preliminary feature of the Black Sturgeon Forest Management Unit.

2. LABORATORY AND FIELD ACCOMMODATION

Little additional construction was undertaken at field stations in 1953 while the program of field station property improvement continued. At the Cedar Lake Field Station a water storage tank and water system were installed, providing running water in all field station buildings. At the Black Sturgeon Lake Field Station, a small cottage for the Station cook was constructed. General improvement of

existing buildings at the Laniel Field Station was continued

3. STAFF

During the late winter of 1953, a decision was reached to integrate all forest entomological research work of the Forest Biology Division in Ontario under the direction of the Sault Ste. Marie Laboratories. Consequently, Messrs. C. S. Kirby and R. J. Finnegan of the Forest Biology Laboratory (Forest Zoology Section) Toronto, were transferred to the staff of the Forest Insect Laboratory in late spring and assigned to continue studies already in progress in southern Ontario on the bionomics and control of the European pine shoot moth, and on the bionomics and control of elm bark beetles, respectively.

In early October, Dr. W. G. Wellington, Head, Bioclimatology Section, transferred from the Forest Insect Laboratory to the Forest Biology Laboratory, Victoria. Bioclimatological investigations in Ontario will be continued by Messrs. C. R. Sullivan and G. W. Green.

In early December, Dr. B. M. McGugan transferred the office of Co-Ordinator, Forest Insect and Disease Survey, which had previously been operated from Sault Ste. Marie, from the Forest Insect Laboratory to Divisional Headquarters in Ottawa.

In April, Dr. W. R. Henson transferred from the Forest Insect Laboratory to the Forest Biology Laboratory, Calgary, to continue bioclimatological studies in that area.

At the end of July, 1953, Dr. D. A. Fraser transferred from the Forest Insect Laboratory to the Forestry Branch, Department of Northern Affairs and National Resources to continue work already in progress at the Petawawa Forest Experiment Station, Chalk River, Ontario.

Mr. S. McDonald transferred from the Forest Insect Laboratory to the Science Service Laboratory, Lethbridge in May, and in April and

November, respectively, Messrs. W. E. Cawthray and J. R. Rooke resigned their positions in the Forest Insect Laboratory to accept employment outside the Government service.

During the academic year 1953-54, eight staff members of the Laboratory were granted educational leave to undertake postgraduate studies:

Educational Leave with Half Pay -

I. M. Campbell, University of Toronto;

K. R. Elliott, University of Western Ontario;

G. W. Green, McGill University;

W. L. Sippell, University of Michigan;

C. R. Sullivan, McGill University;

H. M. Thomson, McGill University.

Educational Leave Without Pay -

H. D. Haswell, University of New Brunswick;

C. S. Holling, University of Toronto.

During the fiscal year, postgraduate degrees were granted to four staff members:

I. M. Campbell, M. A. University of Toronto;

A. W. Ghent, M. A. University of Toronto;

K. J. Griffiths, M. A. University of Toronto;

A. M. Heimpel, Ph. D. Queen's University.

It is with regret that the death is recorded of a member of the staff of the Forest Insect Laboratory while on duty. On July 28, 1953, W. R. Sillers, Forest Biology Ranger, Chapleau District, drowned in Manitowik Lake, north of Sault Ste. Marie, while on a canoe trip in company with Ranger H. J. Weir.

Staff of the Forest Insect Laboratory
Organization
Fiscal Year 1953-54.

ADMINISTRATION

R. M. Belyea.....Agr. Res. Off. 7
B. A. Poupore.....Supervising Clerk
J. P. Taylor.....Clerk 4
C. F. Linklater.....Clerk 3
F. Newman.....Clerk 3
M. J. Foulds.....Steno. 2 (resigned Aug. 23/53)
D. L. Irwin.....Steno. 2 (appointed April 1/53)
F. C. Sinclair.....Steno. 2
D. R. Cartmill.....Clerk 2 (appointed Dec. 31/53)
G. R. Prokopchuk.....Clerk 1
J. E. Douglas.....Asst. Tech. 2

MAINTENANCE

W. M. Ferguson.....Technician (Engineer) 3
P. E. Daynard.....Technician (Engineer) 2
J. Wilton.....Technician (Engineer) 2
E. Ross.....Technician (Engineer) 2 (resigned Sept.15/53)
N. Radke.....Technician (Engineer) 1
J. Thorp.....Technician (Engineer) 1 (resigned Dec. 7/53)
W. Ross.....Technician (Engineer) 1
D. G. MacGillivray.....Technician (Engineer) 1 (appointed Nov. 18/53)
W. T. Eagle.....Technician (Engineer) 1 (appointed Oct. 15/53)
E. L. Baxter.....Technician (Engineer) 1 (appointed Sept.19/53)
G. A. King.....Maintenance Craftsman 4

CO-ORDINATOR, FOREST INSECT AND DISEASE SURVEY CANADA

B. M. McGugan.....Agr. Res. Off. 6 (transferred to Ottawa Headquarters Dec. 1/53)

FOREST INSECT SURVEY

W. L. Sippell.....Agr. Res. Off. 1
N. W. Y. Watson.....Agr. Res. Off. 1
D. R. Wallace.....Agr. Res. Off. 1
L. E. Fremlin.....Tech. 1 (resigned Oct. 22/53)
G. G. Lewis.....Asst. Tech. 3 (transferred from Ottawa May 1/53; reassigned to Entomology Division Oct. /53)
D. M. McNamee.....Asst. Tech. 2
C. M. DuFresne.....Asst. Tech. 2
M. F. Kelley.....Asst. Tech. 1
A. L. Bishop.....Asst. Tech. 1 (appointed Oct. 13/53)
H. J. Smith.....Stud. Asst.
S. Nelson.....Stud. Asst.

M. P. Kelleher.....Stud. Asst.
M. Woodside.....Labour (seasonal)
M. Bruce.....Labour (seasonal)
A. Rowe.....Labour (seasonal)
M. Crack.....Labour (seasonal)
A. Laine.....Labour (seasonal)
E. Keuchmeister.....Labour (seasonal)

STUDIES OF STAND DEVELOPMENT AND SPECIES COMPOSITION, BOREAL FOREST

H. D. Haswell.....Agr. Res. Off. 1
D. F. Bracken.....Surv. Asst.

FOREST BIOLOGY RANGERS

J. E. MacDonald.....in Charge.....F.B.R.4
J. J. Lynch.....Survey Assistant (Assistant to J. E. MacDonald in Sault Ste. Marie District)
P. E. Buchan.....Sioux Lookout district.....F.B.R.1
W. J. Miller.....Kenora district.....F.B.R.3
J. R. McPhee.....Fort Frances district.....F.B.R.1
H. R. Foster.....Port Arthur district.....F.B.R.2
K. C. Hall.....Geraldton district.....F.B.R.2
J. Robinson.....Kapuskasing district.....F.B.R.1
D. F. Lynn.....Cochrane district.....F.B.R.1
M. Thompson.....Timiskaming district.....F.B.R.1
H. Weir.....White River district.....F.B.R.1
R. Sillers.....Chapleau district.....F.B.R.1
C. Vaillancourt.....Gogama district.....F.B.R.1
E. O. Clinton.....Sudbury district.....F.B.R.1
A. A. Harnden.....North Bay district.....F.B.R.3
F. A. Bricault.....Parry Sound district.....F.B.R.1
M. Hildebrand.....Algonquin district.....F.B.R.1
H. G. McPhee.....Lake Simcoe district.....F.B.R.3
A. S. Danard.....Lake Huron district.....F.B.R.2
L. Jago.....Lake Erie district.....F.B.R.1
L. S. MacLeod.....Trent and west part of Quinte district FBR1
J. C. Charbonneau.....Rideau and east part of Quinte district FBR2

INVESTIGATIONS, SAULT STE. MARIE

Cytogenetic Investigations of Forest Insects

S. G. Smith.....Agr. Res. Off. 8
G. W. Stehr.....Agr. Res. Off. 4
I. M. Campbell.....Agr. Res. Off. 1
D. E. Maxwell.....Agr. Res. Off. 1
H. McDonald.....Stud. Asst.
R. F. Knapp.....Stud. Asst.
B. J. Spratt.....Stud. Asst.
K. F. Bruce.....Asst. Tech. 1
B. A. Westman.....Asst. Tech. 1 (June 8/53 to Sept. 14/53)

Investigations of Insect Behaviour and Bioclimatology

W. G. Wellington.....Agr. Res. Off. 8 (transferred to Victoria October 8/53)
W. R. Henson.....Agr. Res. Off. 4 (transferred to Calgary April 17/53)
G. W. Green.....Agr. Res. Off. 1
A. S. W. DeFreitas.....Stud. Asst.
P. M. G. West.....Asst. Tech. 2

Investigations of the Physiology of Forest Insects

G. T. Harvey.....Agr. Res. Off. 1
A. W. Hadden.....Asst. Tech. 1

Investigations of Borer Damage in Fire-killed Pine, Mississagi Fire Area, and Studies of Immature Forms of Cerambycid Larvae

L. M. Gardiner.....Agr. Res. Off. 1

Investigations of Pathogens of the Larch Sawfly

A. M. Heimpel.....Agr. Res. Off. 1

Science Service Consultant, Forest Protection Ltd., New Brunswick Spray Project

K. R. Elliott.....Agr. Res. Off. 1

INVESTIGATIONS, SOUTHERN ONTARIO

Investigations of the Bionomics and Control of the European Pine Shoot Moth (Angus, Ontario)

C. S. Kirby.....Tech. Off. 2
R. W. Fassold (part time).....Surv. Asst.

Investigations of Insects Affecting Seed Production in Red Pine (Angus, Ontario)

L. A. M. Lyons.....Agr. Res. Off. 1
R. W. Fassold (part time).....Surv. Asst.

Investigations of the Bionomics and Control of Elm Bark Beetles (Old Castle, Ontario)

R. J. Finnegan.....Agr. Res. Off. 1
L. Schiller.....Labour (seasonal)

Studies of the Parasites of Neodiprion sertifer (Strathroy, Ont.)
(Seconded to Neodiprion sertifer investigations, Laboratory of Insect Pathology)

K. J. Griffiths.....Agr. Res. Off. 1

Investigations of the Control of Sawfly Populations by Small Mammals (Strathroy, Ontario)
(Seconded to Neodiprion sertifer investigations, Laboratory of Insect Pathology)

C. S. Holling.....Agr. Res. Off. 1

INVESTIGATIONS, CHALK RIVER FIELD STATION

Ecological Studies of Yellow Birch and Associated Tree Species with reference to Birch Dieback

D. A. Fraser.....Agr. Res. Off. 4
W. G. Campbell.....Surv. Asst. (May 20-Aug. 4/53)
G. R. Childerhose.....Asst. Tech. seasonal (Aug. 5-Sept. 8/53)

Bioclimatological and Ecological Investigations, White Pine Weevil

C. R. Sullivan.....Agr. Res. Off. 1
E. Vuorimaki.....Surv. Asst.

INVESTIGATIONS, BLACK STURGEON LAKE FIELD STATION

Investigations of the Deterioration and Death of White Spruce

J. B. Thomas.....Agr. Res. Off. 1

Investigation of Populations, Development and Natural Control of the Spruce Budworm, Lake Nipigon Area

H. M. Thomson.....Agr. Res. Off. 1
K. Ronald.....Surv. Asst.

Ecological Investigations, Balsam Fir and Poplar

A. W. Ghent.....Agr. Res. Off. 1

Investigations of the Pathogens of the Spruce Budworm

H. M. Thomson.....Agr. Res. Off. 1

Survey Assistants, Black Sturgeon Lake Field Station

K. Ronald
K. B. Freeman
J. C. Pick
E. A. C. Hagley
H. P. Carmichael
C. W. Barnes

INVESTIGATIONS, CEDAR LAKE FIELD STATION

Investigations of Populations, Development and Natural Control of the Spruce Budworm, Northwestern Ontario

J. R. Blais.....Agr. Res. Off. 5
J. R. Rooke.....Tech. Off. 2 (resigned Nov. 30/53)

Phenological Investigations of Forest Insects and Their Host Trees

A. H. Rose.....Agr. Res. Off. 1
J. R. Reynolds.....Surv. Asst.

Survey Assistants, Cedar Lake Field Station

J. R. Reynolds
F. M. Kahan
L. W. Jacobsen

LABORATORY AND FIELD PHOTOGRAPHY

D. C. Anderson.....Tech. 2
E. E. Heino.....Asst. Tech. 1

OPERATION, MAINTENANCE AND DEVELOPMENT, FIELD STATIONS

CHALK RIVER FIELD STATION

D. A. Fraser (in charge).....Agr. Res. Off. 4

LANIEL FIELD STATION

A. Denis (caretaker).....Caretaker 2

BLACK STURGEON LAKE FIELD STATION

J. B. Thomas (in charge).....Agr. Res. Off. 1
J. B. Howe (admin. asst.).....Labour (seasonal)
T. A. Kelley (cook).....Labour (seasonal)
A. Kelley (cook's helper).....Labour (seasonal)
J. Kirby (maintenance).....Labour (seasonal)
W. Halibisky (maintenance)....Labour (seasonal)

CEDAR LAKE FIELD STATION

J. R. Blais (in charge).....Agr. Res. Off. 5
D. A. Thomas (admin. asst.)...Labour (seasonal)
R. Guay (cook).....Labour (seasonal)
D. Rhind (maintenance).....Labour (seasonal)
D. Austin (maintenance).....Labour (seasonal)

4. CONFERENCES, ANNUAL MEETINGS, SPECIAL TRIPS AND ASSIGNMENTS

Dr. S. G. Smith attended the Ninth International Genetics Conference at Bellagio, Italy, in August, 1953. While in Europe, he visited the University of Lausanne in Switzerland and the Universities of Dundee, St. Andrews and Glasgow, and the John Innes Horticultural Institution in Great Britain. The Tenth International Genetics Conference is to be held in Montreal at McGill University in 1958, under the sponsorship of the Genetics Society of America. Since this conference will require a division of responsibility between Canadian and United States members of the Society, Dr. Smith attended an organizational meeting in Boston in December, 1953, at which he was appointed Chairman of the Canadian Finance Committee and a member of the General Organizing Committee.

During the 1953 field season, Mr. K. R. Elliott was again assigned as Science Service Consultant to Forest Protection Limited to assist in the Spruce Budworm Aerial Spraying Project in New Brunswick.

At the request of the Director, Science Service, Dr. S. G. Smith attended, as an official Science Service observer, a Symposium on Origins of Drug Resistance and Related Problems, sponsored by the U. S. Department of the Navy and the University of Pennsylvania, at Washington, D. C., March 25-27, 1954.

During the period February 9-11, 1954, Messrs. S. G. Smith, C. S. Kirby and R. M. Belyea attended a joint conference of members of the Forest Biology Division and the Biological Control Unit, Entomology Division, in Ottawa at which closer integration of the work of the two agencies was discussed.

At the request of the Chief, Forest Biology Division, Dr. R. M. Belyea attended discussions of divisional participation in aerial spraying operations in New Brunswick and Quebec in 1954, held at the Forest Biology Laboratory, Fredericton, N. B., January 11-15, 1954.

On February 5, 1954, Dr. R. M. Belyea attended a meeting called by the Ontario Forest Industries Association in Toronto at which the present status of the spruce budworm outbreak in northwestern Ontario was discussed with representatives of industry and the Provincial Government.

During the fiscal year, staff members of the Laboratory attended conferences and meetings of professional and scientific societies, at which some presented papers. A complete listing of conferences attended follows:

Entomological Society of Ontario
London, Ontario, November 17-18, 1953
S. G. Smith
A. H. Rose
A. M. Heimpel
C. S. Kirby

XIX International Physiological Congress
Montreal, Quebec, August 31 - September 4, 1953
G. T. Harvey

American Association for Advancement of Science
Boston, Mass., U.S.A., December 26-December 31, 1953
S. G. Smith

Entomological Society of Canada
Victoria, B. C., October 19-21, 1953
B. M. McGugan

Canadian Institute of Forestry
Winnipeg, Manitoba, October 19-21, 1953
J. R. Blais
A. W. Ghent
J. B. Thomas
L. M. Gardiner

Northeastern Forest Pest Control Committee, Field Meeting,
Stowe, Vermont, U.S.A., September 8-10, 1953
R. M. Belyea

Ecological Society of America
Madison, Wisconsin, U.S.A., September 6-9, 1953
D. A. Fraser
C. R. Sullivan
H. D. Haswell
B. M. McGugan

Research Council of Ontario, Advisory Committee on Forestry Research
Toronto, Ontario, September 30-October 1, 1953
R. M. Belyea

5. THESES AND PUBLICATIONS

Theses

Heimpel, A. M. "Investigations of the mode of action of strains of Bacillus cereus (Fr. and Fr.) pathogenic for the larch sawfly (Pristiphora erichsonii (Htg.))." Ph.D. Thesis, Queen's University, 1954.

Ghent, A. W. "An investigation of the feeding behaviour of the jack pine sawfly, Neodiprion banksianae (Roh.) (Hymenoptera : Tenthredinoidea : Diprionidae)". M. A. Thesis, University of Toronto, 1954.

Griffiths, K. J. "Variations in morphological characters of some sawflies of the family Diprionidae". M. A. Thesis, University of Toronto, 1953.

Campbell, I. M. "A study of polygenic inheritance with special reference to the inheritance of fecundity in Choristoneura (Lepidoptera : Tortricidae". M. A. Thesis, University of Toronto, 1954.

Research Contributions

Blais, J. R.
Effects of the destruction of the current year's foliage of balsam fir on the fecundity and habits of flight of the spruce budworm.
Canad. Ent. 85 : 446-448, 1953.

Blais, J. R.
Borer control in balsam fir, spruce and jack pine logs.
Can. Dept. Agric. Bi-Mon. Prog. Rept. 9 (2) : 2-3, 1953.

Blais, J. R.
The recurrence of spruce budworm infestations in the past century in the Lac Seul area of northwestern Ontario.
Ecology 35 : 62-71, 1954.

Campbell, I. M.
Morphological differences between the pupae and the egg clusters of Choristoneura fumiferana (Clem.) and C. pinus Free.
Canad. Ent. 85 : 134-135, 1953.

Fraser, D. A. and Mawson, C. A.
Movement of radioactive isotopes in yellow birch and white pine as detected with a portable scintillation counter.
Can. J. Bot. 31 : 324-333, 1953.

Gardiner, L. M.
Larval description of Acmaeops proteus (Kby.).
Canad. Ent. (in press). 86 : 190-192, 1954.

Green, G. W., and Henson, W. R.
A new type of comprometer for laboratory and field use.
Canad. Ent. 85 (6), 1953.

Heimpel, A. M.
Unusual predation of the larch sawfly.
Can. Dept. Agric. Bi-Mon. Prog. Rept. 9 (4) : 2, 1953.

Heimpel, A. M.
A strain of Bacillus cereus Fr. and Fr. pathogenic for the larch sawfly, Pristiphora erichsonii (Htg.).
Canad. Ent. 86 : 73-77, 1954.

Rose, A. H., and Blais, J. R.
A relation between April and May temperatures and spruce budworm emergence.
Canad. Ent. (in press). 85 : 174-177, 1954.

Smith, S. G.
Reproductive isolation and the integrity of two sympatric species of Choristoneura.
Canad. Ent. 85 : 141-151, 1953.

Smith, S. G.
Chromosome numbers of coleoptera.
Heredity, 7. Part 1 : 31-48, 1953.

Smith, S. G.
A pseudo-multiple sex-chromosome mechanism in an Indian gryllid.
Chromosoma 5 : 555-573. 1953.

Smith, S. G.
A breakdown among the components that provide reproductive isolation between the spruce and jack pine budworms.
Can. Dept. Agric. Bi-Mon. Prog. Rept. 9 (3) : 2. 1953.

Smith, S. G. and D. E. Maxwell
Post-reduction of the X chromosome and complete chiasma interference in the Lampyridae
Can. J. Zool. 31 : 179-192. 1953.

Stehr, G. W. K.
A mutation of eye colour in Choristoneura fumiferana (Clem.).
Can. Dept. Agric. Bi-Mon. Prog. Rept. 9 (6) : 2, 1953.

Sullivan, C. R.
Use of radioactive cobalt in tracing the movements of the white pine weevil Pissodes strobi Peck.
Canad. Ent. 85 : 273-276, 1953.

Sullivan, C. R. and Wellington, W. G.
The light reactions of larvae of the tent caterpillars, Malacosoma disstria Hbn., M. americanum (Fab.) and M. pluviale (Dyar).
Canad. Ent. 85 : 297-310, 1953.

Thomas, J. B.
Mortality of white spruce, Lake Nipigon area.
Can. Dept. Agric. Bi-Mon. Prog. Rept. 9 (2) : 2, 1953.

Wallace, D. R.
Some reactions of larch trees to larch sawfly defoliation.
Can. Dept. Agric. Bi-Mon. Prog. Rept. 10 (1) : 2, 1954.

Watson, W. Y.
Two new species of Coccinellidae.
Canad. Ent. 86 : 45-47, 1954.

Watson, W. Y.
A method of rearing sawflies from willow galls.
Can. Dept. Agric. Bi-Mon. Prog. Rept. 9 (6) : 2, 1953.

Wellington, W. G.
Motor responses evoked by the dorsal ocelli of Sarcophaga aldrichi Parker, and the orientation of the fly to plane polarized light.
Nature 172 : 1177-1179, 1953.

Extension Contributions

Sippell, W. L.
The forest tent caterpillar in northwestern Ontario
Log Book, March-April, 1953.

Wallace, D. R.
The current spruce budworm outbreak in the western forest region of Ontario
Log Book, November-December, 1953.

Wallace, D. R.
Forest tent caterpillar populations in northwestern Ontario
Log Book, March-April, 1954.

Reviews

Smith, S. G.
A review of "Evolution in the genus Drosophila"
by J. T. Patterson and W. S. Stone
Canad. Field-Nat. 67 (3) : 141-142, 1953.

6. FINANCIAL STATEMENT

The Forest Insect Laboratory and the Laboratory of Insect Pathology operate under a joint accounting administration, and funds for both laboratories are therefore provided in the same estimates. While it has been the practice to maintain a secondary accounting of expenditures by function, this was not possible during the 1953-54 fiscal year because of changes in, and a major reorganization of, clerical staff. The following statement, therefore, itemizes expenditures by allotments only for the fiscal year 1953-54:

GENERAL ALLOTMENTS

Travelling Espenses.....	48,619.71	
Freight, Express and Cartage.....	1,215.58	
Postage.....	1,418.99	
Telephone and Telegrams.....	1,968.68	
Supplies and Materials.....	22,178.59	
Repair and Upkeep, Buildings and Works.....	8,275.23	
Repair and Upkeep, Equipment.....	4,419.88	
Rental of Land and Building Space	180.00	
Rental of Equipment.....	4,537.90	
Public Utility Services.....	12,833.21	
Unemployment Insurance.....	122.16	
Miscellaneous.....	1,779.76	
Sub-Total.....		107,549.69

SPECIFIC ALLOTMENTS

Wages.....	10,680.05	
Acquisition of Equipment.....	15,562.45	
Acquisition of Buildings and Works	83,387.29	
Sub-Total.....		109,629.79
TOTAL.....		217,179.48